IN THE CLAIMS:

Please cancel claims 1-38 without prejudice or disclaimer, and substitute new claims 39-76 therefor as follows:

Claims 1-38 (Cancelled).

39. (New) A method for determining a load exerted on a tyre fitted on a vehicle during running of said vehicle on a rolling surface, the tyre comprising an equatorial plane, comprising the steps

providing a concave upward function $F_z = F_z(PL_c)$ of said tyre load versus a length of a contact region between said tyre and said rolling surface;

estimating said length (PL_c) substantially at the equatorial plane; and

deriving the tyre load corresponding to said estimated length from said function.

40. (New) The method according to claim 39, wherein said function is a polynomial function of degree at least two of said length.

41. (New) The method according to claim 39, wherein said function is $F_z = \dfrac{-B + \sqrt{B^2 - 4A(C - PL_c)}}{2A}$ wherein A, B and C are fit coefficients related to a structure of said tyre.

42. (New) The method according to claim 39, wherein said function is $F_z = A1 \cdot \tan(B1 \cdot PL_C)$, wherein A1 and B1 are fit coefficients related to a structure of said tyre.

43. (New) The method according to claim 39, wherein said step of estimating said length (PL_c) comprises the step of acquiring an acceleration signal.

44. (New) The method according to claim 43, further comprising the step of low-pass filtering said acceleration signal.

45. (New) The method according to claim 43, wherein said step of acquiring an acceleration signal comprises acquiring a tangential acceleration signal.

46. (New) The method according to claim 45, wherein the step of estimating said length comprises measuring a distance between a maximum value and a minimum value of said tangential acceleration signal.

47. (New) The method according to claim 43, wherein said step of acquiring an acceleration signal comprises acquiring a radial acceleration signal.

48. (New) The method according to claim 45, wherein the step of estimating said length comprises measuring a distance between two maxima of said radial acceleration signal.

49. (New) A method of controlling a vehicle having at least one tyre fitted thereon, comprising:

estimating a load exerted on said tyre by a method according to claim 39;

passing said estimated load to a vehicle control system of the vehicle; and

adjusting at least one parameter in said vehicle control system based on said estimated load.

50. (New) The method according to claim 49, wherein said vehicle control system comprises a brake control system, and said step of adjusting at least one parameter comprises adjusting a braking force on said tyre.

51. (New) The method according to claim 49, wherein said vehicle control system comprises a steering control system, and said step of adjusting at least one parameter comprises selecting a maximum variation allowed from steering commands.

52. (New) The method according to claim 49, wherein said vehicle control system comprises a suspension control system, and said step of adjusting at least one parameter comprises adjusting a stiffness of a suspension spring associated with said tyre.

53. (New) The method according to claim 49, wherein said vehicle comprises at least one tyre fitted on its right and at least one tyre fitted on its left, said vehicle control system comprising an active roll control system, and said step of adjusting at least one parameter comprising compensating an unequal load distribution between said left fitted tyre and said right fitted tyre.

54. (New) A system for determining a load exerted on a tyre fitted on a vehicle during running of said vehicle on a rolling surface, comprising:

a measuring device adapted to estimate a length (PL_c) of a contact region between said tyre and said rolling surface substantially at the equatorial plane; and

at least one processing unit adapted to derive the tyre load corresponding to said estimated length from a concave upward function $F_z = F_z(PL_c)$ of said tyre load versus the length of contact region between said tyre and said roiling surface.

55. (New) The system according to claim 54, wherein said function is a polynomial function of degree at least two of said length.

56. (New) The system according to claim 54, wherein said function is

$F_z = \dfrac{-B + \sqrt{B^2 - 4A(C - PL_c)}}{2A}$, wherein A, B and C are fit coefficients related to the structure of said tyre.

57. (New) The system according to claim 54, wherein said function is $F_z = A1 \cdot \tan(B1 \cdot PL_C)$, wherein A1 and B1 are fit coefficients related to a structure of said tyre.

58. (New) The system according to claim 54, wherein said measuring device comprises a tangential or a radial accelerometer producing a corresponding acceleration signal.

59. (New) The system according to claim 58, wherein said measuring device comprises a sampling device adapted to sample said signal at a frequency of at least 5 kHz.

60. (New) The system according to claim 59, wherein said sampling device is adapted to sample said signal at a frequency of at least 7 kHz.

61. (New) The system according to claim 54, further comprising at least one memory associated with said processing unit.

62. (New) The system according to claim 61, wherein said at least one memory comprises pre-stored characteristic functions describing vertical tyre loads versus contact region lengths.

63. (New) The system according to claim 61, wherein said at least one memory comprises pre-stored instructions for said processing unit.

64. (New) The system according to claims 54, wherein said measuring device is included in a sensor device located in a tread area portion of said tyre.

65. (New) The system according to claim 64, wherein said sensor device is secured to an inner liner of the tyre.

66. (New) The system according to claim 65, comprising a damping element between said sensor and said inner liner.

67. (New) The system according to of claim 63, wherein said sensor device further comprises a transmitting device.

68. (New) The system according to claim 67, wherein said transmitting device is operatively connected to a first antenna.

69. (New) The system according to claim 58, further comprising a filtering device adapted for low-pass filtering said signals.

70. (New) The system according to claim 64, wherein said sensor further comprises a power source.

71. (New) The system according to claim 70, wherein said power source comprises a battery.

72. (New) The system according to claim 70, wherein said power source comprises a self-powering device adapted to generate electrical power as a result of mechanical stresses undergone by said sensor device during running of said vehicle.

73. (New) The system according to claim 72, wherein said self-powering device comprises a piezoelectric element.

74. (New) The system according to claim 72, wherein said self-powering device comprises an electrical storage circuit.

75. (New) The system according to claim 74, wherein said electrical storage circuit comprises a resistor and a capacitor.

76. (New) The system according to claim 64, wherein said processing unit is included within said sensor device.